A DISCOURSE OF THE Sulphur-Bath AT KNARSBROUGH IN YORK-SHIRE.

BY WILL. SIMPSON, M. D.

LONDON,
Printed for *Will. Cooper* at the *Pellican* in *Little-Britain*, 1675.

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A Diſcourſe of the Sulphur-Bath *at* Knarsbrough, *concerning its Cauſes and Virtues.*

THat I may not be injurious to what I have already writ in my two former Books, entituled *Hydrologia Chymica* and *Hydrological Eſſays*, concerning the *Sulphur-Well* at *Knarsbrough*, as a *mineral water* of great uſe in its virtues inwardly taken. But now deſigning an account thereof, as a *Bath* for outward uſe, ſhall therefore, in order to the better underſtanding of what I aim at, here reſume ſo much of my former *diſcourſe*, concerning the *Eſſential ingredients*, and *neceſſary principles* of that *Water*; together with an addition of ſome more recent *obſervations*, as may ſerve to illuſtrate what I now intend to be my preſent task: Our method will be as followeth.

1: To

1. To lay down the constitutive ingredients or *mineral principles* of that *Water*.

2. To shew the process (as near as we can apprehend) *Nature* useth in the preparing this *excellent water*.

3. To shew the difference betwixt this and other natnral *Hot-Baths*, as in their original and inbred *principles*; so also in some sort as to their virtues.

4. To shew how, and by what means, the *Sulphur* (as the chief *mineral ingredient* in this water) is so opened, as to become, not only so subtile, as thence to be solvable *odore tenus* therein; but also so *volatile*, as to pass off in a continual *steame*, and insensible *effluvium*.

5. How this *Sulphur-water* comes not much short, as to its *original principles*, nor is much (if at all) inferiour in its efficacy, to some other *Sulphur-waters*, which are *Hot-Baths*; inasmuch as this is lately found to be *successful* for *outward applications*, as well as those by late *observation* are remark'd for inward use.

6. To shew, that the artificial heating of the *Sulphur-water*, bears some analogy to the *inbred heat* of other *Baths*, as they come hot out of the Earth.

7. To shew, how *Art* may imitate *Nature*, (but yet from the same *principles*) in the resemblance of most *Baths*, *viz.* how to prepare such *Baths* artificially, as are natural.

Lastly,

Laſtly, To inquire how and after what manner this *Sulphur-water* performs thoſe expected helps, as a *Bath*: where, in ſhort, will be *illuſtrated* its various virtues in order to the help of ſeveral *Maladies*.

Firſt, As to the conſtituent ingredients or *mineral principles* of this *water*: We ſay they are compriz'd in theſe three, *viz.* 1. A *marine* or *foſſil Salt*. 2. A *Sulphurous Apporrhea* or *ſteam* of *Sulphur*. Laſtly, A little *aluminous acidity*. As to the firſt, viz. *Salt*, is apparent both from its brackiſh taſte, as alſo from what *remains* upon its *diſtillation* or *evaporation*; of which we find betwixt one and two drams in a quart thereof: as we further ſhew in our *Hydrologia Chymica*, &c.

2. As to the *Sulphrous principle*, thats manifeſt, 1. From its Taſte and Smell; as alſo from its hogo upon the *riſlings* and *regurgitations* of the Stomack, after taking thereof. 2. From its colouring of *Silver* dipt therein; which it doth as readily as the ſolution or waſhings of *crocus metallorum* from the *Sulphur* of the *Antimony*; or as the ſolution of *common Brimſtone* in the preparing *Lac Sulphuris*, both being made from the *Acids* of *alcalizate Salts*, as will appear (although a paradox) more clearly anon.

And laſtly, from its *colouring* of *Silver* by its very *Steams*, as we ſhall ſhew more afterwards.

Now

Now the queſtion may be ask'd, whence this *mineral water* has its *Sulphur*? I anſwer, that there are plenty of *vitriolin Marcaſites* well ſaturate with *Sulphur*, out of which I have, by an artifice (taught in my *Hydrological Eſſays*) ſeparated perfect *Brimſtone*, which melted into *magdalions* or *rolls*, are not diſtinguiſhable any manner of way from the common: beſides which *Marcaſites* (found not far off this Spring) the very adjacent *Earth* is full of *Brimſtone*.

Laſtly, As to the ingredient of *Alom*, its diſcoverable theſe ways following, firſt from the *Alom-Bed* through which this *water* at laſt paſſeth, or at leaſt toucheth upon, as is obvious to any eye that will look at it, being cloſe adjoyning to the *exit* of the *water*.

2. By its *acidity* in the *water*, as is evident from its *curdling* of *Milk*: for the *Salt* ſeparated from the *Sulphur-water*, being put into boyling *Milk*, will make it ſhil into *Curds* and *Whey*, as if ſome *acidum* was poured thereto, which *common Salt* will not do; for we try'd both, and that in the ſame proportion, and found the *Sulphur Salt* to cauſe a ſpeedy *ſeparation*, and that in great quantity; and the common Salt made a little *ſeparation*, of a *lighter coagulum*, but did not make it ſhil, or alter the ſeeming colour or conſiſtence of the *Milk*: And laſtly, if the powder of *Coral* or

Crabs-

Crabs-Eyes be put thereto, they imbibe or mortifie the *acidity* of the *Alom*, and cauſe a *Milkieneſs* from the *volatile Sulphur*.

And as the three aforeſaid ingredients are found to be the *conſtitutive principles* of this *water*, ſo that neither *vitriol* nor *nitre* (however ſome imagine the contrary) are contain'd therein, is evident, firſt as to *vitriol* (which gives the moſt ſuſpition from the plenty of its *Marcaſites*, found not far from the *Well*) becauſe it will ſtrike no *tincture* with *Galls*, as we ſhall ſhortly further evince: And as to *Nitre*, there is not the leaſt ſuſpition, either from what is *ſeparable* from the *water*, nor from any *mineral glebe* adjacent thereto, that we have yet diſcovered.

Secondly, As to the proceſs *Nature* uſeth in the preparing this excellent *mineral water*, or the manner of her mixing the foreſaid ingredients, by her *Chymiſtry* in the bowels of the *Earth*, in order to the making up the forenamed *Sulphur-Bath*: In ſhort thus, a *water Spring*, ſuppoſe, paſſing through or by a *minera* of *foſſil Salt*, part of which it diſſolves, and afterwards in its current either *meeting* with ſome *acid juice*, whether of *vitriol* or of other *mineral glebes*, becomes impregnate therewith, and obviating, or rather ſupervening a *Sulphurous Mineral*, from the concourſe of which two, happens a *Fermentation*; or elſe,

elſe, this Saline Solution comes upon a *minera*, whether that of *vitriol*, or what other ſoever it be, in the *meanders* of the *Earth*, whoſe *principles* are yet *crude*, and onely *embrionative*; whereupon it ſets thoſe native and congenit *principles* awork, into a *Fermentation*, either way, I ſay, it becomes capable of raiſing that inteſtine motion, we call *Fermentation*, and thence of ſo ſubtilizing and volatizing the *Sulphur*, as to make it ſolvable in *water*, (as we have illuſtrated more demonſtrably above in our *Doctrine* of *Hot-Baths*.) But not ſtaying here, becauſe of the continual afflux and preſſure of *water*, at length it paſſeth through an *Alom-bed*, whoſe *acidity* precipitates in great part the body of the *diſſolv'd Sulphur*; in which very *precipitation* happens its fatid ſmell, and *Sulphurous hogo*, which onely paſſing through a ſlender *Colander* of Sand, retains its lately contracted odour; where it filters off from the more *groſs* precipitated *body*, and ſo makes its *exit*.

Which gives great probability of *heat* in the ſource of its *original mixture*, and that if the *Spring* did immediately after that *Solution* and *Fermentation* break forth, it would be *hot*, atleaſt *warm*, after the manner of other *Hot-Baths*; but being carryed on in a longer line, in its *ſubterraneal current*, before it breaks forth, *looſeth* that *heat* contracted upon the

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Fermentation of the aforeſaid *mineral juices*.

And this is likewiſe remarkable concerning *Alom intereſted* in the fabrick of this *water*, *viz.* that I have (as often as I pleas'd to make the experiment) taken ſome of the *ſucculent Alom* ſlate or ſtone (found cloſe by the *Well*) which has had the *Salt* diſcernably extraverted, which when I *ſcrap'd* into ſimple *water*, would with *Galls* forthwith *ſtrike* a deep *Purple*: after the manner which the ſucculent *Alom-ſtone* doth, which is got upon the *Scarbrough Bank*, near that *Spaw* [about which our great controverſie, concerning that *waters* being *aluminous*, and not *vitriolin*, did chiefly depend] which experiment I have ſeveral times ſhewed to *perſons* no leſs *ingenious* then *inquiſitive*.

I alſo order'd an infuſion to be made of ſome of the ſame *Alom-ſtones* in above a Gallon of *freſh water*, then to be *evaporated* to about half a Pint, which filtred, I evaporated further in *Balneo M.* to try if it would ſhoot *per ſe*, but it would not, onely came to a ſoft ſort of *matter* or *mellago*.

3. As to the third thing propounded, *viz.* the difference betwixt this and other natural *Hot-Baths* in their *original principles*, and *primary cauſes*: We think that from what has already been ſaid, and eſpecially what yet remains to be diſcours'd of, in the next, and

other *ſucceeding propoſals*, that the differ[illegible]e of theſe from other *Sulphurous waters*, both as to their *origin* and *virtues*, will ſufficiently be declared: And that *Sulphur* (of one ſort or other) is *chiefly concern'd* in the fabrick of all *Hot-Baths*, and other *Sulphurous waters*, compleating with other *concurring juices*, the eſſence of them both.

4. As to the fourth propoſal, *viz.* how, and by what means, the *Sulphur* (as the chief *mineral ingredient* in this *water*) is ſo *opened*, as to become, not onely ſo *ſubtile*, as thence to be ſolvable *odore tenus*, but alſo ſo *volatile*, as to paſs off in a *continual ſteam*, and *inſenſible effluvium*; For the great query is, how *Sulphur* may be ſo opened, as to make the *Sulphur-well*, and other *Sulphurous waters* of the like nature.

While I was therefore ſeriouſly ruminating upon this matter, *viz.* what it was that might truly be ſaid to *open* the *body* of *crude Sulphur*, whether it was an *Acid* or an *Alcali*, I began to conſider how many *ways*, and by what *means*, it was uſually ſo *opened*, as to make a *ſolution* in any *Liquor*: Firſt I conſidered it was *ſolvable* for the moſt part in all *Oyles*, by the help of *Fire*: and that I imagin'd happened from the analogy of parts, betwixt *Oyles* and *Sulphurs*; both of them being chiefly *Sulphurs* under a *diſguiſe*, the one in a *concrete*, the

the other in a *liquid form*; both of them alſo in their *bellies* hiding their *intrinſick Acids*, the *Oylie* or *Sulphurous parts* of both by *Fire* melting together, in the *fluid form* of a *Balſome*, while the *acidum*, chiefly of the *Sulphur*, being thereby in part *ſeparated*, doth *concreſcere* into a *ſaline form*, under the appearance of *cryſtals*, as is obvious in the preparing the *Balſome* of *mineral Sulphur* or *Brimſtone*.

And as *vinous Spirits* are *vegetable Sulphurs*, comminuted and ſubtiliz'd by *Fermentation*; ſo theſe are alſo *ſuccedaneous* to *Oyles*, in the ſolutions of *Brimſtone*, yet need previous preparations by *fixt Alcalies*, (as they are called) for being ſo *ſpiritualiz'd*, are not ſuch apt *menſtrua* for ſolutions of *crude Minerals*, as *Oyles* are, although either of them are powerful enough for making very ſtrong and furious *Fermentations* with the aforeſaid *mineral Sulphurs*, once by their *congenial Acids*, brought, by help of *Fire*, into a *fluor*, in the form of *corroſive menſtrua*: witneſs the high ebullitions betwixt *vinous Spirits* or *Oyles*, and *Spirit* of *Nitre*, *Aqua-fortis*, *Oyle* of *Vitriol*, &c. ſome of them ſo very furious in their *Fermentation*, as to ariſe to an *actual flagration* (as we elſewhere demonſtrate.)

So that *crude Sulphurs*, unopened by the actuations of the *acidum* of *Fire*, (which alſo

sharpen the implanted *Acids* of such *Minerals*) do *dissolve* quietly without any tumult, (if done leasurely) and melt together into one *Balsamick Liquor*, (though if hastily done with a pretty *smart Fire*, they make a *crackling noise*) whereas the foresaid *mineral Sulphurs* being *subtiliz'd* by their own *Acids*, fortified by the *acidum* of *Fire*, in their *distillation*, are brought thereby into a *fluor* of both *principles*, and if then mixed with the foresaid *vegetable Sulphurs*, contract a furious *Fermentation*, from the fresh *collisions*, betwixt *Acids* and *Sulphurs*, and if close shut up, would break in pieces the strongest Vessels art could contrive.

And as the foresaid solutions of *mineral Sulphurs*, are perform'd by *Oyles* and *vinous Spirits*, from analogy of parts; I considered whether other sorts of solutions of *crude Brimstone*, or the like *Sulphurous Minerals*, might not also be done, by the like analogy, and then I pondered upon the *alterations* made upon *Brimstone*, &c. by *fixt alcalies* (which how properly call'd, we shew in our *Halologia*) and *quick-lime*, and by well weighing the matter, found, that as *Brimstone* was dissolvable in *Oyle* and *Spirit* of *Wine*, as aforesaid, so *fixt alcalies* work upon *Sulphurs*, no otherwise then as they are *acido-sulphurous Salts*.

For

For I conſidered that *volatile Alcalies*, ſuch as are all *urinous Spirits*, work not at all upon, nor cauſe any alteration in *Sulphurs*: therefore it muſt needs follow, that wherein *fixt* and *volatile alcalies* do agree, or in that property, which is common to them both, I mean, their *precipitating faculty*, neither of them is concern'd in the *ſolutions* of *Brimſtone*, and that is common, both to *fixt* and *volatile Alcalies*, to precipitate, what *Acids* have diſſolv'd. Now the reaſon why *urinous Spirits*, I mean *volatile Alcalies* (as they are call'd) do not at all work upon *Brimſtone*, is, becauſe they contain ſo very ſlender a texture of *Acids*, and no *Sulphurs* (if highly rectified) and therefore are incapable by analogy of working upon the aforeſaid *bodies*: how fixt *Alcalies* are a new *compage* of their own native *Acids* and *Sulphurs*, together with the intertexture of *urinous Spirits*, (from whence proceeds its precipitating faculty) all bound up by the *acidum* of the *Fire*, (which is their *vinculum*) and not a *ſimple Salt*, we elſewhere in our *Hiſtory* of *Tartar*, declare more at large.

While I was pondering upon this matter, at length methought I eſpyed a great *harmony* in *natures works*; I ſaw that ſhe perform'd the ſame *ſolutions* of *mineral Sulphurs*, in ſome parts of the *bowels* of the *Earth*, by her own *menſtrua*

strua of *Acids*, prepared by her dextrous *Art* of *Chymistry* (the very foundation and exemplar of all we call *Artificial*) as she did in other actions, reputed (amongst most Authors) *Heteroclites*; and was the same in the latter, as the former; and from hence I saw, that reputed *caustick*s, I mean *fixt lixivial Alcalies*, were no other then *Acids*, viz. of the *Fire*, fixt upon bodies: so that I found *nature symbolical* in all her *actions*, and always consonant to her own *principles*.

And that I might *improve* this *notion* the better, (not taken notice of by any other Author I know) I began to make a *strict scrutiny* into the *nature* of *fixt Alcalies*; I considered, First, That the more *Fire* they endured, and the *higher* they were *calcin'd*, and the sooner us'd after *calcination*, the *stronger* and more *fiery Caustick*s they were.

2. That they would never *calcine* to a strong *Salt*, unless perform'd in *open Vessels* or *Crucibles*, where the *Fire* might more immediately touch upon them, and *concentre* its own *acidum*.

3. That if after they were *cold*, and kept from the *Air*, and then *Spirit* of *Wine* or *Water* was put thereto, thence a *heat* was presently *produc'd*, which as I conceive, was from no other cause then this, *viz.* That either of those *Liquors*, sets the *acidum*, contracted from the *Fire*, and the *Sulphur* or *volatile Alcaly* in

in the *Salt*, into a ſudden *Fermentation*, diſſolving, and ſo putting them into an *inteſtine colliſion.*

4. And fourthly I conſidered, That the longer theſe *Salts* were expos'd to the *Air*, even to a ſolution *per deliquium*, the more mild and ſoft in operation they become; *looſing* thereby gradually their *Acids* imbibed from the *Fire*; inſomuch as by often ſolution *per deliquium*, the *compage* of that *Salt*, from the *vinculum* of the *fiery Acid*, is taken off, as that the whole may thence be *reduc'd* into an *inſipid Water* and *Earth* (and no *Arcanum* neither.)

Laſtly, That although theſe fixt *lixivial Salts*, do make ſtrong *Ebullitions* with *Acids* put to them, yet that happens, either betwixt the additional *acid*, and the *Sulphur* in the *Salt*, or betwixt it, and the *volatile alcaly*, bound up in the *artificial concretion*: That there are *Sulphurs* in thoſe *Salts*, or new textures of Plants, appears from their *lixivial* or *ſaponary* property: and that there are alſo *volatile alcalies*, is evident from their precipitating faculty, and from their *inteſtine ſtrugling* with *acids.*

To which may be added this *obſervation*, that after *fixt alcalies* have loſt the *acidum* contracted from *Fire*, (which they do by keeping, and ſometimes expoſing to the *air*, toge-

ther with the addition of somewhat which dints the foresaid *Acidum*;) may then by Art, be made to split into *Oyle* and *urinous Spirit*, or *volatile Salt*.

As to that great objection against the *acidity* of *fixt lixivial Alcalies*, viz. the precipitation of such solutions made with *Alcalies* by *Acids*, inasmuch as it is generally observ'd, that what solutions *Alcalies* make, are most promptly *precipitated* by *Acids*. I answer, First, That although what more simple, I mean, *volatile Alcalies* do dissolve, are precipitated very readily by *Acids*, *& vice versa*, yet where *Alcalies* are more complicated, and interwoven with other essential parts, there the *precipitation* by *Acids*, of what those already have dissolv'd, are in no wise wholly ascribable to them as *alcalies*, but equally compitible to other parts in the concretion.

And in the next place I answer, that even some *acids* are capable of *precipitating* what others have *dissolv'd*; to prove and illustrate which, I try'd this following instance, *viz.* I took a clear solution of *Saccharum Saturni*, which I had prepared with *distilled Vinegar*, which no man will deny to be an *Acid*; upon which I poured a pretty smart *Spirit of Vitriol*, whereupon it presently became *Milkie*, and caus'd a *precipitation* of a pure *white calx* of *Saturn*, which *precipitation* may also be done with *Spirit* of *Salt*. The

The ſame likewiſe will *Spirit* of *Salt* do, poured upon a ſolution of *refin'd Silver*, made in double its weight of *Aqua fortis*, in preparing that admirable anomolous neutral concretion, call'd *Luna Cornea*, mentioned by the *honorable Boyle* in his *origin* of *forms*: and not onely *Spirit* of *Salt* but alſo *Oyle* of *Vitriol* will cauſe the like *precipitation*.

Whence its obvious to any eye, that what ſome *Acids* diſſolve, others may precipitate from the *congenealneſs* of the *ſolvend*, to one *ſolvend* more then another: For both thoſe wherein the *ſolutions* of the *metals* were made, viz. *Spirit* of *Vinegar* and *Aqua-fortis*, are as undoubtedly *acids*, as thoſe which cauſe the *precipitations*, viz. *Spirit* of *Vitriol*, and *Spirit* of *Salt*.

So that the precipitation of bodies depend not upon *acid* or *alcalizate Liquors*, as ſuch; but upon the *conſanguinity* (if I may ſo ſay) of *bodies* or *ſolvends*, to *liquors* or *ſolvents*, *viz.* whilſt an *acid* having diſſolv'd one *body*, meeting with another *akin* thereto, lets the former *fall*, and from an abſtruce *affinity* of parts, *diſſolves* the latter.

From whence it need not ſeem *heterodox*, (although to the moſt it may, as yet, a *paradox*) to ſay, that *fixt Alcalies* open the bodies of *mineral Sulphurs*, as they are *acido-Sulphurous Salts*; and that chiefly as they par-

take

take of the *acidum* of *Fire*, assum'd by *calcination*: and that *precipitations* of the same *solutions* may be perform'd (and that too without the least absurdity in *Philosophy*) by other supervening *Acids*, as we have even now demonstrated.

As I observ'd all *fixt Alcalies* made out of *Vegetables*, to work upon *Mineral Sulphurs*, on the account of their being *Acido-Sulphurous-Salts*; so I could not otherwise (whilst I look'd upon the matter with a very intent eye) judge of *calx vive*; whose manner of operation, in opening the bodies of *Brimstone*, and other *Mineral Sulphurs*, I could not charge to any other then its *Acid*, which it had contracted from the *Fire*, in the very *calcination* of that sort of Stone, call'd *Lapis calcarius*, (*viz.* Free-stone or Lime-stone) which that it chiefly partakes of the *Acidum* of *Fire*, and thereby performs not only that, but various other effects, we have already in short demonstrated, and shall further in *Lithologia Physica*.

From the premisses it will easily appear, in *confirmation* of our *former Doctrine*, that all solutions of *Mineral Sulphurs* in the bowels of the *Earth*, are made by their *peculiar Acids*; and that other solutions made by *Art*, are but from the same *principles* under other *disguises*; Therefore that which opens the body of *Sul-*

phur

phur in theſe *Mineral Marcaſites*, through which this *water* (we treat of) *runs*, muſt of neceſſity be an *Acidum*, which afterwards is precipitated by another *Acid* of the *Alom-bed*, through which at laſt it paſſeth.

As to that *experiment* we gave to *illuſtrate* the cauſe and manner of making that *water*, by opening thoſe *vitriolin Marcaſites* with *quick-lime*, in our *Hydrological Eſſays*, although we there imputed it to the *alcali*; yet now from ſecond and more mature thoughts, grounded upon experiment, as aforeſaid, find it otherwiſe; where we profeſs ſuch an avowed *proſelyteſhip* to truth (ſufficiently amiable and worthy in it ſelf) as upon neaſer apprehenſions thereof, grounded upon better *weighed principles*, to decline what we have formerly at greater diſtance in any matter opiniated, and in this particular, have thence reaſon to wave the former, and to aſcribe the ſolution of this great *Phœnomenon* to the latter, *viz.* to the *Acid* in *calx vive*, which, in ſome meaſure, bears an *analogy* with that *Acidum*, nature uſeth by her own *Chymiſtry*, in the *intrails* of the *Earth*, for the ſolutions and extractions of *Sulphurs*.

As to the 5*th* thing propoſed to *diſcourſe* of in this our *method*, *viz.* how this *water* comes not much ſhort, as to its *original principles*, nor is much inferiour in its efficacy, to ſome other

other *Sulphureus waters*, which are *Hot-Baths*, which is evident (beſides what has already been ſaid) by the ſequel thereof, *viz.* becauſe the manner of uſe of both, in reſpect of what they have been, are now reciprocal; thoſe of *Hot-Baths* being formerly chiefly known for *outward*, and theſe for *inward uſe*. But now of late are found, the former in ſome caſes to be ſucceſsful for inward uſe; the latter by *obſervation*, are now eminently remarkable for *outward application*: ſo that the manner of uſe of them *per ſe* conſidered, is inverted, and in a mutual reſpect, is reciprocal.

As to the *virtues* of thoſe *Hot-Baths* (which are lately found remarkable for inward as well as outward uſe) I mean eſpecially thoſe of our *own Country*, the Reader may conſult Dr. *Jorden* his *diſcourſe* of *Natural Baths*, and of late the *Phyſicians*, who have and yet do attend thoſe *waters*.

As to the *virtues* of this *Sulphur-water* (our preſent Theme) as to the uſe thereof as an inward *Medicine*, the Reader may conſult Dr. *French* his Book, and the patient the *Phyſicians* there. It remains now to ſpeak of it in *relation* to outward uſe, as a *Bath*, and this leads me to the next conſiderable, *viz.*

6. That *artificial heating* of the *water*, bears ſome *analogy* to the *inbred heat* of thoſe other *Baths*, as they come *hot* out of the *Earth*.

To

To the illuſtrating of which we are to conſider *Sulphur* or *Brimſtone* (according to our former Doctrine, that it may become *ſolvable* in *water*, is either to be *comminuted* and *volatiz'd* by the native or ſuperinduc'd *Acids*, and that by a brisk *Fermentation* from the mutual *colliſions* of the two *principles*, whence the heat of *natural Baths*, as aforeſaid, or elſe the *Sulphur*, by ſleighter *touches*, and ſlenderer *vibrations* from congenial *Acids*, becomes ſolvable in a *preterlabent water*, whoſe *heat* therefore (if any) in the ſource of *Fermentation*, is but gentle: yet by that ſleight ſolution of *Sulphur*, it becomes capable of precipitation by another *Acid*, (viz. of *Alom*) as happens in this *water* we treat of: That a body of *Brimſtone* is precipitated is evident from Dr. *Neals obſervation*, concerning a cruſt of *Brimſtone* which he found under the *Stones* of the *Old-Well* at the removing them, through whoſe crevices the *water ſprang*: and that the *Acidity* by which the precipitation is made, is from the *Alom*, doth as clearly appear from the *Aluminous black Stones*, found in the further digging for a better *Spring*. Now what remains in the water after the foreſaid *precipitation*, is no other then the *apporrhea*, or ſubtile *affluvium* of *Sulphur*, which being diſperſed through the whole body of the *water*, is always upon the wing, flying off continually.

This

This *effluvium* of *Sulphur* complicated with *Salt* in the body of the *water*, although it be very *volatile*, (as I said) yet that it may the better *permeate* our bodies, in order to the performing those expected helps, its necessary (as to outward use) that the *waters* should be *heated*, by which the *volatile parts* are put into a more *vigorous motion*, and made capable of *penetrating* our *juices* the better: For although *in frigido*, the Sulphurous parts are by a volatility continually winding off, yet by *heating*, its put into a more lively *action*, and made more readily *Fermentable* with the humours of our bodies.

Now that the *Sulphur* in this *water* consists of tenuous parts, and very *volatile*, is evident (besides what already has been said) by this following *observation*, viz. that during the time I *Bath'd* therein, and afterwards went to Bed, having laid my *Silver-studded Watch* upon the Table, thereby to observe the time of *Bathing* and *Sweating*, I found the *steam* of the *heated water* had guilded it at such a distance; and is so *conspicuous*, as to change the colour, (as I have observ'd) of the *Brass-Candlesticks* which stood in the next room to the *Bath*. Yea, although this be very *volatile*, yet that it doth not suddenly take *wing*, is hence evident, because after three hours time, that the *water* had been heated, when I got up, I dipt a *Six-*

pence

pence therein, which it ſtill guilded very readily.

7. As to the *artificial* reſemblance of *Sulphur Baths* by imitation of *Nature*: Firſt as to *Hot-Baths*, that indeed we fall ſhort in, becauſe its the *work* of *Nature* in the great *Fermentation* of *Mineral juices*, in order to the production of *Mineral concretes*: And ſeeing *Art* doth of neceſſity always *petere principia* from *Nature*, and that thoſe *principles* are *ſeminal*, therefore not to be imitated by *Art*; But inaſmuch as all *Fermentation* amongſt *Minerals*, (as we have formerly ſhew'd) conſiſts in the *inward conflicts* of *Mineral Acids* and *Sulphurs*, and that according to the different aſſaults of the ſaid *Acids*, upon varieties of *Sulphurs*, depend the *ſpecification* or formal difference of *Mineral Waters*; ſo in particular this *Water* being chiefly compos'd of a *Sulphur*, wrought upon by an *Acid*, and afterwards precipitated by another; the reſemblance by *Art* muſt be from the ſame ſort of *principles*, grounded upon the natural: Thus what an *Acid*, (native or ſuperinduc'd) performs upon *Mineral Sulphur*, in order to the making that *Mineral Solution*, required for the *natural compoſure* of this *Water*; The ſame will the *Acidum* of *calx vive*, or of *fixt Alcalies* do *ſuo modo* to *Common Brimſtone*, or other *Mineral Sulphurous Concretions*, as aforeſaid.

And

And lastly, As to the virtues hereof: This *Water* being gradually *heated* (as is said) becomes a *Bath*, whose *Sulphur* hereby first *penetrates* the better into our *Fermental juices*, exciting them, if *languid* through *Hydropick Acids*, or spurious, through *Scorbutick Acids*, in the one by helping (with other concurring Medicaments) to remove obstructions from *coagulated Acids*; in the other, by precipitating, altering and sweetening *Scorbutick Acids*, the cause of pains and particular tumours.

2. Hereby it the better reacheth to dint that *Fermental Acor* of the *Gout*, impress'd upon the *Synovia* of the *Joints*, so easily communicable to the *adjacent Nerves*; hence is the reason why its found so effectual for the *Scurvey*, *Gout*, &c. *viz.* because these forenamed Diseases are chiefly determined and specificated by *Acids*, coagulated upon different humours and parts: For its the Essential efficacy (if I may so say) of a *subtiliz'd Sulphur* to dint *Acids*, and thereby to resolve such as are coagulated; so that to me the *discussion* of all *tumours*, whether *Scorbutick* or others, depend upon the *resolving* those coagulated *Acids*, the intimate and real efficients thereof. No sooner doth a Spurious predominant *Acid* coagulate any portion of the *blood*, or other *juice* in any part of the body, but presently an

an obstruction of those parts happen, more or less, according to the intense or remiss degree of the prevalent *Acid*, which as it falls out in Vessels or Bowels reputed more or less noble, *viz.* intensely or remissly concerned in the *fabrick* and *circulation* of *vital juices*, and *animal Spirits*, so it becomes the patron of different sorts of Diseases; some whereof easily bending to more facile *methods* of *Cure*; others more stubborn (of which are the last mentioned) not yielding but to more volatile, subtiliz'd, and penetrative *Sulphurs*, such as are in this and other *Sulphureous Baths*.

By which (I mean our *Sulphur-Bath*) *Scorbutick* and *Podagrick* Patients have received considerable relief: for which cause, many persons, finding thereby so much alleviation of the otherwise grievous Symptoms, and such a mittigation of the severity of future fits of the *Gout*, (I mean as to what they might have expected, without such a previous help) do voluntarily make their *annual returns* to the *Bath*: of which I could give several instances, but that it doth not suit my present design.

3. By the use of this *Bath*, the blood and humours are *purified*, whence it becomes proper for *Blotches*, *Scabs*, *Itches*, *Elephantiasis*, or *Bastard Leprosie*, and other *Scorbutick impurities* of the *Blood*; For it procures most excellent *Sweats*, whereby the other impure

Acids, (which are precipitated or cast off from the *Blood* in its *circulation*, and topically *fixed* upon this or the other *external part*) are loosened, dissolv'd, or mortifi'd; which deprav'd *Acids* lodge in the habit of the body, having their very *Roots fixed* in the ultimate digestion, vitiating the *Blood* and *Latex*, sent thither for the ordinary nutriment of the body, in the common circulation thereof; yea, they are sometimes so *fixed* upon their own *Roots*, as to transmute the otherwise *alimentary juice*, by their *Ferments*, into those *external impurities*: which they do as really as a *Crab-tree-scions*, or *Bud*, ingraffed into a good *Apple-stock*, doth (from its own *seminal Ferment*) turn the *juice* of the *Stock*, into the *nature* and *property* of a *Crab*: So that in such *external vitiating* of the *humours*, which are onely skin deep, the applications in order to *Cure* or *Abstorsion*, must be such as can mortifie, dissolve, alter or correct the foresaid *externally scituated Acids*, which may be, and is, most aptly perform'd by this *Sulphur-Bath*.

So that in many the like cases, where those *Acids* are most *pertinacious*, and the *Maladies* thence have taken *deepest root*, viz. in the *Elephantasis*, *Psora*, *Leprosie*, &c. the most common and usual *Purges* and *Diaphoreticks*, are altogether *insignificant*, because they reach not those deeply impress'd *Acids*, nor correct those

those *spurious Ferments*, seated, yea rooted in the *habit* of the *body*; which such *subtiliz'd Sulphurs*, as are in this *Bath* skilfully applyed (with other assisting Medicines) are apt chiefly to perform.

Amongst which *external impurities*, the *Lues Venerea* (being made by carnal contract) may not improperly be reckoned; which consists in a peculiar sort (in its kind) of a contagious *Fermental Acid*, thence communicable to the *juices* of the *body*, especially where the *contagious Ferment*, by the first contract, entered; which by its *corroding acor*, as a caustick, fretting and inflaming those *tender parts*, or *coagulating* the *juices* of some particular parts (brought thither by an afflux of humours) into *venereal tumours*, whose restless *Ferments* yet lodge in their Bellies, or inwards, in both become the *Authors* of *Nocturnal pains*, *polutions*, &c. to the dinting of which spurious *Fermental acor*, (the cause of the aforesaid dolours) the just mulct of that Sin must be chiefly aim'd at, in the curing thereof: which besides other *Diaphoreticks*, may very well be perform'd by the help of this *Bath*: And that too, because *Sulphurs*, (especially such as are *prepared* and *volatiz'd* by the *admirable Chymistry* of *Nature* in the body or bowels of the Earth) do *sweeten* and *mortifie* all such sort of *Acids*: For which purpose,

in

in order to the Cure thereof, not only *Bathing*, (and some other assisting *Diaphoreticks*) but also the *drinking* the same *water* is requisite.

4. By the use of this *Bath*, the *nervous maladies* are also much helped, of which sort are *Cramps*, *Convulsions*, *Palsies*, *Apoplexies*, being caused from the various seisures upon these *juices*, also from the *contorsions* and *disablements* of the Vessels or *Conduit-pipes*, (the *Nerves*) those *juices* are circulated, or at least carryed in, being the *Organs* wherein the *animal Spirits* move in order to sense, motion, and other *vital functions*, proper thereto, whose tone are altered, contorted, contracted, or relax'd by several sorts of supervening *Acids*, sent up in *flatulent steams*, resulting from some spurious subordinate *Fermentation*, whose *Acids* being strong, have prevail'd, and by a sort of *sublimation* are at length *fixt* upon those *animal Cords*, causing obstructions, contractions, relaxations, *&c.* (according to the *morbid Acids*) the causes of Diseases relating to the *genus nervosum*.

Now as *Acids* are the cause why *Nerves* undergo those various *alterations* in their *tone* or *texture*, by contractions, relaxations, *&c.* and in their *juices* by coagulations, and thence obstructions, or other debilitudes, whereby the volatile nimble *animal Spirits* become *interrupted* in their *motion*, being block'd up by such

such sort of *coagulations*: so in order to the Cure of these Diseases, such *Medicaments* and *Methods* are to be inquired into, as may *dint*, *alter*, and *dulcifie* such kinds of *Acids*, and thence may loosen the *contracted*, smooth and make even the *contorted*, may strengthen the *relaxed Cords*, yea and may every way answer the *indications* of the deprav'd *tones* of those *animal pendula's* or *vital strings*, whereby the imprisoned *Spirits*, (the immediate product of *vital Fermentation* may again be set at liberty, and all the *animal functions* be restored to their *pristine state*: of which sort are our *Sulphur-Bath*, which by correcting the *Acids*, supple and soften the *contracted*, strengthen and bind up the *weak*, and very much repair, in the *maine*, the *deprav'd tone* of the *genus Nervosum*.

Lastly, By the use of this *Bath*, the contraction of the tendons, and musculous parts, I mean *stiffness* of the *Limbs*, *Joynts*, &c. (where the contraction is not too fixed) are often remedied: For these outward maladies being caused through some rejected *Acids*, which wanting a due *Fermentative motion* to give them *wing* by *perspiration*, are *coagulated* or *hardened* (partly by the assistance of the Air) in the external parts; but by the *Sulphur* in the *Bath*, the pores being opened, and they dissolv'd, and put into *motion*,

are

are either sweetened or carryed off.

Also its proper for alleviating *Aches, Old pains, Strains, Sciatica's,* (which is a sort of *Gout* in those parts) *Rheumatisms,* and other griefs now too tedious to relate: concerning most of which we might have given som particular instances, but that it doth not suit with our present design, undertaking chiefly a *rational account* of its *causes,* and in general of its *virtues*: As to the particular cases themselves, which may confirm what we have already deposited as to the medicinal efficacy thereof, we shall refer to another opportunity.

The END.

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